

KUNBO ZHANG

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EDUCATION

Ph.D. and M.S. in Mechanical Engineering 09/2006 - 02/2011 (Expected)
Stony Brook University, Stony Brook, NY GPA: 3.49/4.00
Thesis: Fault Detection and Diagnosis of Multi-Actuator Pneumatic Systems

B.S. in Automatic Control 09/2002 - 06/2006
Beijing Institute of Technology, Beijing, China GPA: 3.70/4.00
Selected courses: Electronic Technique of Electric Power, Electronic Circuit Analysis, Fundamentals of Control Theory, Control Theory of Electrical Machinery, Intelligent Control and Operations Research

TECHNICAL SKILLS

Software: LabVIEW, Matlab/Simulink/SimPowerSystems, ATP-EMTP, SolidWorks, Pro/ENGINEER, AutoCAD, ANSYS, Mathematica, MS Office (Word, PowerPoint, Excel), Unix/Linux and LaTeX

Programming Languages: C/C++/VC++, VBasic/Pbasic and PLC (FST, VersaPro)

Instrumentation: PLC, DAQ, Oscilloscope, Soldering, Thermocouple, CNC, Rapid Prototyping, Displacement Transducer, Accelerometer, Pressure Sensor, Proximity Sensor, Strain Gauge and Wireless Sensor

Languages: English (fluent) and Mandarin (native)

EXPERIENCE

Research Assistant 09/2007 – Present
Manufacturing and Automation Laboratory, Stony Brook University, Stony Brook, NY

Distribution Line Fault Location Estimation and Characterization Analysis

- Tested single line-to-ground fault in home voltage level simulations (AC 0V~120V 100m) to estimate fault locations via voltage and Hall-effect current sensors signals at two ends
- Investigated various fault location estimation methods from EPRI and IEEE (C37.114) using experimental signals and calculated error less than 7% based on Impedance method
- Synthesized waveform signatures and arc models to distinguish fault types and detect fault durations

Electric Arc and Glowing Connection Research in Home Fire Prevention

- Devised and developed the first and only wall outlet with BSafe Elextrix by detecting abnormal heat to shut off and prevent glowing based on TFCI™ thermal Cut-Off technology (UL listed)
- Designed and built serial and parallel arc fault test beds for 120V home outlets based on ANSI/UL 1699 Arc-Fault Circuit-Interrupters (AFCIs)
- Inspected and summarized phenomena of abnormal heat and glowing connection at every plug outlet and wiring screw terminal using multiple sensors
- Examined transient and permanent arc characteristics and theorized arc energy hysteresis loops

Fault (Leakage) Detection and Diagnosis (FDD) in PLC Control Pneumatic Systems

- Collaborated with Festo (US) in data analysis of pneumatic system leakage and initiated Festo pneumatic FDD research of diagnostic modules GFDM software
- Designed and conducted leakage tests of pneumatic actuation systems controlled by Festo PLC with data acquisition and customized computer control interfaces (Matlab and VC++)
- Developed FDD dynamic models at different leakage levels & locations and invented an innovative vectorized map & voronoi diagram method to effectively locate potential faults
- Established a one-cylinder pneumatic system using wireless sensors to transmit data

Teaching Assistant 09/2006 – Present
Department of Mechanical Engineering, Stony Brook University, Stony Brook, NY

- Gave lectures and recitations teaching of courses, “*Mathematical Methods in Engineering Analysis*”, “*Advanced Dynamics*”, “*Manufacturing Processes*” and “*Vibration & Control*”
- Tutored 60 students to design (SolidWorks) and fabricate mechanical parts using rapid prototyping (FDM 3000), ultrasonic welding (Branson 2000), wire EDM (Sodick AQ-300L) and CNC mill & lathe (Dyna Myte 2800 & Minitech) machines in lab sessions

Industrial Intern

Beijing General Research Institute of Mining & Metallurgy, Beijing, China 02/2006 - 06/2006

- Assembled and tested GE series 90-30 PLC control BPSM-I on-line particle size analyzers increasing 5%~10% grinding efficiency
- Spearheaded in software development of BPSM-I touch screen control panel using VersaPro
- Designed and developed analog and digital I/O circuit using modules ALG221 and ALG391 integrated with PLC control

Jiangsu Zijin Electronic Group Corp., Ltd., Nanjing, Jiangsu, China 01/2006 - 02/2006

- Observed and experienced single-sided/double-sided printed circuit board (PCB) manufacturing process including patterning, photoengraving, drilling, soldering, surface mount, screen printing and testing
- Operated CNC drilling machine, SMT placement machine, wave soldering machine, cleaning machine and reflow oven to fabricate PCB for PLC

Undergraduate Research Projects

02/2005 – 06/2006

Key Laboratory of Power System Protection and Dynamic Security Monitoring and Control,

North China Electric Power University, Baoding, Hebei, China

- Improved traditional voltage and reactive power integrated control for substations based on fuzzy logic and dynamic borderline and verified performance of new fuzzy control theory
- Increased effect of control and operation stability (3.5%) and decreased taps and capacitors operations numbers (18%~30%) through analyzing simulation results of both stationary and dynamic borderline control systems(Matlab and Power System Analysis Software Package)
- Published one paper, “Research on Substation Reactive Power Control with the Fuzzy Logic Method” in Power Engineering Conference, 2005. IPEC 2005

Strategy & Programming Group, Beijing Institute of Technology CCTV Robot Contest Team

- Coordinated 6 team members in discussing control and game strategies of three robots and optimizing route planning to fulfill consecutive tasks through actions of pick, carry, move and place in minimum time
- Implemented embedded system control design of one manual and two automatic robots including microcontroller 8051 programming, PWM DC motor control, line detection and speed sensing
- Supported Mechanical Design Group in manufacturing specialized robot parts using CNC machines

ACTIVITIES AND HONORS

IEEE Power & Energy Society Member

IEEE Student Member

New York Academy of Sciences Member

Travel Award	NSF CMMI Research and Innovation Conference, Hawaii	06/2009
Judge and Reviewer	Long Island Junior Sciences & Humanities Symposium	2009
Organizer	North America Chinese Soccer Grand Tournament (8 teams)	09/2009
Captain	Sony Brook Chinese Soccer Team (40 persons)	2008, 2009
Outstanding Graduate of Beijing	Beijing (top 1%)	06/2006
Outstanding Graduate of Class 2006	Beijing Institute of Technology (top 4%)	06/2006
Group Leader	Strategy & Programming Group, BIT RoboCon Team	10/2005 - 06/2006
Third Place	Beijing Universities Soccer Champion League (out of 80 teams)	11/2005
Excellent Student	Beijing Institute of Technology	2004
Excellent Student Leader	Beijing Institute of Technology (top 2%)	2003, 2005

References and 5 journal & conference papers available upon request